Session: Fishery Management Advice

Chad Demarest

The SSB provides advice and analysis to the Agency and Fishery Management Councils primarily through its involvement in the fishery management plan development and analysis process.

Fishery management plans (FMPs) are primarily developed by the two northeast regional fishery management councils (FMCs), the Mid-Atlantic and New England FMCs. The MAFMC maintains six FMPs, while the NEFMC maintains eight. While the two FMCs operate somewhat differently, SSB contributions to plan development follow roughly similar trajectories. The MAFMC uses Fishery Management Action Teams (FMATs) while the NEFMC employs Plan Development Teams (PDTs)--these are functionally equivalent. SSB personnel serve on 14 of 20 FMATs and PDTs. Additionally SSB staff provides analysis and advice to the NMFS Greater Atlantic Regional Fisheries Office (GARFO) on two FMPs. Outside of this framework, SSB also provides economic analysis and advice for actions taken under the Marine Mammal Protection Act and Endangered Species Act, which are primarily managed by GARFO. Lastly, one member of the SSB sits on the NEFMC's Science and Statistical Committee.

Management plan development typically follows a three-step pattern of (1) scoping and alternatives development, (2) impacts analysis, and (3) review for compliance with NMFS regulatory analysis guidelines. Alternatives development includes the initial work to frame a fishery management problem and develop baseline conditions against which impacts may be compared. Impact analysis can be straightforward but more often includes the use of purpose-built models or ad hoc development of tools specific to the alternatives under consideration. For example, analysis of output-based options would require different analytical tools than a similar analysis of input-based options. After the analyses are completed and relevant decision makers have made decisions, SSB staff must prepare Regulatory Impact Review analyses consistent with E.O. 12866, E.O. 13771 and the Regulatory Flexibility Act. Finally, the Regional Economist (an SSB member, currently the Branch Chief) drafts a clearance memo to assure compliance with these mandates, as required by NMFS Policy Directive 01-111.

Satisfying both the regulatory compliance requirements and the need for social science analysis and advice throughout the plan development process requires a substantial commitment of human capital. In an average year, SSB:

- participates in 20+ management action development team, plan committee, or advisory panel meetings;
- produces 8-10 NEPA social and economic impact analyses;
- produces or assists in the development of 8-10 E.O 12866 and RFA analyses;
- issues clearance letters, via the Regional Economist, for 14 Regulatory Impact Reviews;
- allocates 4,992 hours of FTE labor time to providing analysis and management advice, over one quarter of our total FTE labor time budget.

Analytical methods employed by SSB will vary depending on the specifics of the management action. For example, changes in rebuilding strategies and/or time lines will require both net present value (NPV) and demand analyses, as different landing quantities induce price changes and the costs and benefits of different strategies will vary across time. Estimating changes in employment requires input-output modeling to determine second-order effects from changes in port-level fishery revenues. Estimating impacts on consumers and welfare analyses also require demand analyses to account for how changes in quantity induce price changes. Estimating benefits from recreational fishing opportunities requires non-market valuation techniques such as stated and revealed preference methods. Similarly, estimating costs and benefits related to ESA/MMPA actions will also rely on these techniques. Estimating costs associated with fishing are critical to estimating impacts and considerable effort has been expended to make the most of available cost data by constructing suitable cost

models across our fisheries. Various models are used to predict spatial changes in fishing effort induced by regulations, including Monte Carlo simulation (e.g. QCM), linear programming and decision choice models. Much of this work entails close collaboration with other branches within the Center (e.g. Herring MSE) and/or PDT/FMAT members (e.g. BLAST). Bread-and-butter impacts analyses typically revolve around estimating aggregate producer welfare and disaggregated impacts across metrics such as vessel size class, landing port and gear type. These may be short-run analyses encompassing single-year changes in revenues and operating profits or long-run analyses taking in changes in revenue streams across time and employing NPV calculations. Disaggregated port and community-level impacts analyses are required for social impact analyses focusing on National Standard 8 (impacts on fishing communities).

Data for most basic analyses are readily available from existing data streams. Vessel and landing port data are provided by captains through Vessel Trip Reports and dealers through an extensive Dealer reporting scheme. Variable cost data are obtained by at sea observers, but these data are not a census and require significant modeling experience to use properly. Fixed cost data are critical to understanding economic profits and fishery capacity, and are obtained through purpose-built survey data collections. Where appropriate, quota trade and asset value data are used to estimate agent-based decision models as well as capacity utilization and productivity models. Importantly, asset values from permanent trades (e.g. vessel and permit purchases) are not required data submissions for any Northeast US Fishery Management Plan. Non-market valuation data require dedicated collection efforts, and we have performed several aimed at recreational fisheries but by no means have these efforts been comprehensive. Additional non-market valuation data would be needed to better estimate welfare changes resulting from ESA and MMPA actions. Community-level impacts may be estimated as second-order effects from revenue changes based on extensive work performed by the Branch, but analyses along important social well-being dimensions require additional survey data collections.

SSB staff develop infrastructures that enable both internal (e.g. other SSB and/or Center staff) and external (e.g. Council and NERO staff) analysts. Such infrastructure may include development of new databases/new data sources, quality assurance/quality control of existing data, or software development that enables easier or more streamlined access to existing data sources. While not strictly advice and analysis for managers, these infrastructure development projects are force-multipliers, allowing the region as a whole to meet its needs for social science analysis under the existing constraints on FTE labor and staffing. SSB has allocated roughly 4,000 FTE hours per year, about 20% of our total labor budget, to these sorts of development initiatives.

Several emergent analytic requirements will place new demands on SSB staff. Reconsideration of recreational and commercial allocations in many of our fisheries, resulting from incorporation of new MRIP data, will require understanding the ways in which use of these fishery resources induce changes in social welfare, a process requiring deliberate and time consuming analyses. Meeting requirements for five year reviews of LAPP programs, recently published by NOAA Fisheries S&T office, will also require substantial time investments. Executive Order 13771 places new burdens on the Agency to estimate regulatory costs and benefits for all actions, even those exclusive to the ESA and MMPA. Recent guidance on determining whether non-profit organizations that own fishing rights are small or large businesses under the RFA raises issues that are novel to the branch and will require consideration.

Issues for discussion:

- NE is the only Region with integrated management/regulatory (SF) and science (ST) requirements...what are the benefits? Costs?
- Regional Economist performs clearances on behalf of Regional Administrator (GARFO), not Science and Research Director (NEC)...is this relationship acceptable/sustainable?
- Property rights with respect to analyses are not well established and variable across management units:
    - MAFMC frequently drafts entire analytical sections for documents, including RIRs;

- NEFMC drafts entire sections and RIRs for some fisheries (e.g. scallops) but not others (e.g. everything else);
- GARFO staff sometimes leans on SSB, and sometimes generates analyses independently despite having no professional economists on staff;
- Virtually no support provided to ASMFC.

- Staffing: SSB has lost four FTE's since last program review, three in the last year, and this leaves significant deficits...will we be able to meet current and future mandates?
- Does SSB provide high-quality advice to GARFO, the MA and NE FMCs? Are there gaps? Where could we do better? Strategies for improved integration?

FMP	Action Plan Type	Council	SSB FTE
Summer flounder, black sea bass, scup	FMAT	MAFMC	Scott Steinback, Chad Demarest
Squid, mackerel, butterfish	FMAT	MAFMC	
Bluefish	FMAT	MAFMC	
Tilefish	FMAT	MAFMC	Barbara Rountree
Surf clam/ocean quahog	FMAT	MAFMC	John Walden
Dogfish	FMAT	Joint MA/NEFMC	Scott Steinback
Habitat	FMAT	MAFMC	
Ecosystems	FMAT	MAFMC	Geret DePiper
Northeast multispecies	PDT	NEFMC	Chad Demarest
Atlantic sea scallop	PDT	Joint MA/NEFMC	
Monkfish	PDT	Joint MA/NEFMC	Trish Clay, Tammy Murphy
Habitat	PDT	NEFMC	Geret DePiper
Whiting	PDT	NEFMC	
Atlantic herring	PDT	NEFMC	Min-Yang Lee
Vessel baseline	Other	GARFO	Barbara Rountree
Skates	PDT	NEFMC	
Red crab	PDT	NEFMC	Barbara Rountree
Lobster	Other	GARFO	Barbara Rountree
Ecosystems	PDT	NEFMC	Geret DePiper